

**REMARKS**

This is in response to the Office Action dated September 23, 2005. Claims 16-23 are pending.

Claim 16 stands rejected under Section 103(a) as being allegedly unpatentable over Fuller in view of Buynoski. This Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 16 requires "a metal gate electrode provided on a semiconductor substrate with the intervention of a gate insulating film, wherein *the metal gate electrode directly contacts an upper surface of the gate insulating film so that only the gate insulating film is located between the metal gate electrode and a channel of a transistor for which the gate electrode is provided.*" For example, Fig. 1 of the instant application illustrates that the metal gate electrode 19 directly contacts an upper surface of the gate insulating film 13 so that only the gate insulating film 13 is located between the metal gate electrode 19 and a channel of a transistor for which the gate electrode is provided. Moreover, the metal gate electrode 19 is partly or entirely composed of the same material as the metal contact plugs 20 which are isolated from the gate electrode via insulator(s) 16; and the metal gate electrode 19 and the metal contact plugs 20 have the same height.

Fuller fails to disclose or suggest the aforesaid quoted and italicized features of claim 16. A detailed discussion of Fuller's deficiencies in this respect may be found in the Response filed July 13, 2005. Fuller in Figs. 2E-2F discloses polysilicon gate electrode 211, source/drain regions 213/214, gate insulator 215, and insulating gate sidewall spacers 221. As shown in Figs. 2D-2E of Fuller, a tungsten layer 223 is deposited over the gate and source/drain regions of the transistor and is thereafter planarized so that tungsten portion 231 is provided over the gate and

tungsten portions 232, 233 are provided over the source/drain regions (e.g., col. 4, lines 20-55). However, Fuller fails to disclose or suggest the aforesaid features of claim 16 in view of Fuller's requirement for polysilicon (non-metal) gate electrode 211. Fuller teaches directly away from the invention of claim 16 by requiring non-metal gate electrode 211. Moreover, because of Fuller's use of a non-metal gate electrode, Fuller's structure is highly undesirable because it requires an additional non-metal layer 211 in between the gate insulator 215 and metal 231 thereby adding significant costs and processing requirements to the overall device. In other words, Fuller cannot possibly form the gate electrode 211 and the alleged plugs 232, 233 all in the same step because they are of much different materials – Fuller is highly undesirable in this regard.

The Office Action contends that it would have been obvious to have replaced Fuller's polysilicon 211 with a metal gate electrode that directly contacts the gate insulator, citing Buynoski for support. However, this Section 103(a) modification to Fuller is incorrect for at least the following reasons. Fuller requires polysilicon portion 211 in order to (a) implant impurities into the channel (col. 3, lines 49-51), (b) implant impurities to form the source/drain regions using the polysilicon as a mask (col. 3, lines 66-67), and (c) form the sidewall spacers. Thus, *the use of polysilicon portion 211 is required in Fuller's process and device for these reasons*. One of ordinary skill in the art would never have removed it as alleged in the Section 103(a) rejection because the above-listed steps then could not properly be performed. For example, *one of ordinary skill in the art would never have replaced the non-metal polysilicon 211 of Fuller with a metal as alleged in the Office Action because this would prevent the shallow buried channel from being formed because ions would not pass through a metal (see Fuller at col. 3, lines 49-53)*. Thus, one of ordinary skill in the art would not have removed 211 (or

replaced it with a metal) as alleged in the Office Action because this would destroy the functionality and purpose of the base reference. There is no prima facie case of obviousness, since one of ordinary skill in the art would never have destroyed Fuller by making the alleged modification.

It is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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